

## REMARKS

Attorney for Applicants has carefully reviewed the outstanding Office Action on the above-identified application.

An obviousness-type double patenting rejection was raised with regard to claims 24-28, 31-37, and 40-61 in view of U.S. Patent Nos. 5,872,426, 6,147,452, and 6,005,349 to Kunhardt, et al., which patents are assigned to the same assignee as the present invention. Applicants submit herewith a Terminal Disclaimer to overcome the double-patenting rejection raised in the instant Office Action with respect to U.S. Patent No. 6,147,452 to Kunhardt, et al. Applicant submits herewith a check in the amount of \$55.00 for this Terminal Disclaimer.

Applicants respectfully traverse the rejections raised in the Office Action of claims 24-25 as being anticipated by, and claims 26, 33, and 42-44 being obvious over, European Patent Application No. 89310354.9 to Tsukada.

Applicants' claimed invention relates to a method and apparatus for suppression of the glow-to-arc transition in glow discharges. The invention comprises a perforated dielectric positioned over an electrode for stabilizing glow plasma discharges by suppressing the glow-to-arc transition. The dielectric can be held in place by a collar surrounding the plate and attached to an electrode. Each of the perforations of the dielectric act as a separate, active current-limiting microchannel that prevents the overall current density from increasing above the threshold for the glow-to-arc transition. A single perforated dielectric can be positioned over a single electrode (*e.g.*, a cathode) for suppressing glow-to-arc transition in DC-induced glow discharges.

Optionally, another perforated dielectric plate can be positioned over an opposite electrode (e.g., an anode) for suppressing glow-to-arc transition in AC- or RF-induced glow discharges.

Tsukada discloses a plasma etching apparatus comprising a treatment chamber capable of being evacuated and an electrode structure comprising first and second electrodes in facing relation. A gas is introduced into the chamber through the first electrode, and an RF power source is applied to the electrodes. One of the electrodes includes a graphite panel and a silicide layer, each having a number of through-holes for passing gas therethrough and into the chamber.

Applicants respectfully submit that Tsukada fails to disclose each element of Applicants' claimed invention as set forth in claim 24. Tsukada fails to disclose a glow plasma discharge apparatus for generating and maintaining a glow plasma discharge, comprising a pair of electrodes having a space therebetween; **a perforated dielectric placed over one of the electrodes and partially occupying the space**; and a time varying electric field generated between the electrodes, as set forth claim 24. The electrode structure taught by Tsukada includes a graphite panel (22) and a silicide layer (23), each of the layers including through-holes for passing gas into the chamber. However, neither the graphite panel nor the silicide layer are dielectrics, but rather, are electrical conductors. For example, the specification states in col. 5 at lines 48-49 that the "graphite panel 22 has a high electrical conductivity...." Further, the gas-introducing part 2, which comprises graphite panel 22 and silicide layer 23 (see FIG. 1), is stated in the specification as causing "little electric power loss by virtue of its own electrical conductivity." (col. 4, lines 33-34). As such, Tsukada fails to teach or suggest providing a

perforated dielectric, as set forth in independent claim 24. Claim 25, which depends from claim 24 and contains all of the limitations thereof, is similarly patentable over Tsukada.

Importantly, Tsukada would not work with a dielectric having apertures corresponding to those in the graphite and silicide layers, which would be necessary to allow gas to pass therethrough. Applicants' claimed invention uses a perforated dielectric to confine electrical flow through the perforations. Also, the perforations are on the order of micron dimension, whereas the apertures disclosed by Tsukada are from 0.1 to 0.5 millimeters. Current does not flow through the apertures in Tsukada's graphite. Rather, only gas current flows through the graphite and silicide layers of Tsukada. Further, Tsukada does not teach or suggest limiting current flow.

For the same reason, Applicants respectfully submit that claims 26, 33, and 42-44 are not obvious in view of Tsukada as each of these claims requires a perforated dielectric, which is clearly not taught by Tsukada. As such, Applicants respectfully submit that these claims are also patentable.



All issues raised in the Office Action are believed to be addressed. Claims 24-28, 31-37, and 40-65 are pending in this application. No new matter is believed to have been added. Re-examination is requested and favorable action solicited.

Dated: 2/20/04

Respectfully submitted,

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**Terminal Disclaimer To Obviate A Double  
Patenting Rejection Over A Prior Patent**

Docket No.  
7604/27

In Re Application Of: **Erich Kunhardt and Kurt H. Becker**

Serial No.  
09/381,328

Filing Date  
12/27/99

Examiner  
Patel, V.

Group Art Unit  
2879

Invention: **METHOD AND APPARATUS FOR SUPPRESSION OF THE GLOW-TO-ARC TRANSITION IN GLOW**

Owner of Record: **The Trustees of the Stevens Institute of Technology**

**TO THE COMMISSIONER FOR PATENTS:**

The above-identified owner of record of a 100% percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application, which would extend beyond the expiration date of the full statutory term defined in 35 U.S.C. 154 to 156 and 173, as presently shortened by any terminal disclaimer, of prior Patent No. 6,147,452. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors and/or assigns.

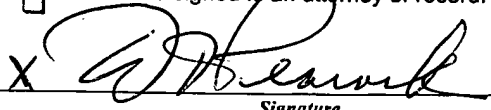
In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. 154 to 156 and 173 of the prior patent, as presently shortened by any terminal disclaimer, in the event that it later expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 C.F.R. 1.321, has all claims cancelled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.


1. ☒ For submissions on behalf of an organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☐ The undersigned is an attorney of record.

X  2/4/04

Dated: 02/27/2004 CCHAU1 00000027 09381328

  
Typed or Printed Name

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- ☒ Terminal disclaimer fee under 37 C.F.R. 1.20(d) included.  
☒ PTO suggested wording for terminal disclaimer was unchanged.  
☒ Certification under 37 C.F.R. 3.73(b) is required if terminal disclaimer is signed by the assignee.